UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,341	08/03/2006	John A. Schield	194-37438-US	8231

44871 7590 03/19/2009

MADAN, MOSSMAN & SRIRAM, P.C.
2603 AUGUSTA DRIVE
SUITE 700
HOUSTON, TX 77057-5662

EXAMINER	
MCCAIG, BRIAN A	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
03/19/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,341	SCHIELD ET AL.	
	Examiner	Art Unit	
	BRIAN MCCAIG	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☒ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Summary

1. This is the initial Office action based on the 10/588341 application filed August 3, 2006.

2. Claims 1-25 are pending and have been fully considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-4, 11, and 14-15 rejected under 35 U.S.C. 102(b) as being anticipated by THOMPSON ET AL (US 4129455), hereafter referred to as THOMPSON.**

5. With respect to claim 1, THOMPSON discloses a composition comprising a first component having the general formula recited in the instant application, specifically, diazabicyclooctane (or, more formally, 1,4-diazabicyclo[2.2.2]octane) [column 1, line 68 to column 2, line 2 & example 1] and a second component comprising a nucleophilic acceptor, specifically, toluene diisocyanate [example 1].

6. With respect to claims 2-4, as previously discussed, the first component is 1,4-diazabicyclo[2.2.2]octane and the second component is an isocyanate.

7. With respect to claims 11 and 14-15, THOMPSON discloses a solvent, specifically dipropylene glycol [examples 1 & 4].

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. **Claims 1-14, 16, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over PETTY (US 2927946) in view of DOBINSON ET AL (US 3707552), hereafter referred to as PETTY and DOBINSON, respectively.**

10. With respect to claims 1-6, PETTY discloses a composition useful for reducing the concentration of mercaptans in hydrocarbons comprising a nucleophilic acceptor such as an epoxide [column 1, line 56 to column 2 line 41] as required in claims 4-6 of the instant application.

11. PETTY does not appear to explicitly disclose the first component according to the instant application as required in claim 1.

12. However, DOBINSON, which is concerned with the reaction between mercaptan groups and 1,2-epoxides discloses the use of a tertiary amine according to the formula of the first component of the instant application, specifically, 1,4-diazabicyclo[2.2.2]octane (aka triethylene diamine OR DABCO) as required in claims 2 and 3, which is preferably used as a catalyst for the formation of thio ethers from reactants comprising mercaptans and 1,2-epoxides [column 6, lines 8-9 & 62-67].

13. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the composition of PETTY with the tertiary amine of DOBINSON in order to prevent epoxide reaction with the phenols thereby creating undesired products as well as to accelerate the rate of reaction, especially with regard to the reaction of epoxides with aliphatic mercaptans as disclosed by DOBINSON [column 6, lines 62-67] in view of PETTY [column 4, lines 42-47]. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

14. With respect to claim 7, neither PETTY nor DOBINSON appear to explicitly disclose that the nucleophilic acceptor is 1,2-epoxyhexadecane. However, PETTY discloses that other epoxides such as decene oxide in addition

to epoxides having 5 or less carbons are useful in the formation of hydroxyl hydrocarbon thio ethers [column 3, lines 1-14] rendering 1,2-epoxyhexadecane an obvious variant.

15. With respect to claims 8-10, DOBINSON discloses the ratio of component A and to a thiol containing compound is approximately 1:10, wherein the thiol containing compound is used to provide 0.75 to 1.25 thiol group equivalents per 1,2-epoxide group [example 3 & column 6, lines 60-64]. Therefore, it is expected that, depending on the particular epoxide compound, the molar ratio of component A to component B is inherently contained within the disclosure of DOBINSON.

16. With respect to claims 11-13, PETTY discloses a solvent comprising a gasoline in which aromatics including xylene are inherently contained.

17. With respect to claim 14, PETTY discloses an alcohol (phenol) {column 3, lines 20-21].

18. With respect to claims 16 and 23, PETTY discloses that the concentration of mercaptans in a hydrocarbon is greater than 0 and when combined with the epoxide produces a hydrocarbon with a second concentration of mercaptans less than the first concentration [examples 1 & 5].

19. With respect to claims 17-19, PETTY does not appear to explicitly disclose the recited concentrations. However, the concentration of the reactant epoxide is a result-effective variable insofar as there is a required stoichiometric concentration necessary to react with the mercaptans in order to reduce the concentrations thereof in a hydrocarbon. The applicant is reminded that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or working ranges by routine experimentation. *In re Aller,* 105 USPQ 233 and *In re Antonie*, 195 USPQ 6.

20. With respect to claims 20-21, PETTY discloses agitating the hydrocarbon so that the epoxide reacts with the mercaptan [column 3, lines 34-37] whiche renders the use of different types of mixing, including inline mixers and jostling on a boat, obvious variants.

21. With respect to claim 22, PETTY discloses that the epoxides can convert hydrogen sulfide to thio ethers [column 1, lines 64-65], which is similar to the hydrogen sulfide scavenger required in the instant application.

22. With respect to claims 24 and 25, PETTY discloses that the hydrocarbon is derived from crude tar acids separatred as a tar acid oil fraction in coal tar distillation or crude petroleum phenols separated from thermally or catalytically cracked petroleum naphthas [column 1, lines 56-61 & table in example 2], which is similar to the residual fuel oil and fuel oil, respectively.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571) 270-5548. The examiner can normally be reached on M-F 8-430.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM
3/10/2009

/Glenn A Caldarola/
Acting SPE of Art Unit 1797